



BERT APERLOO

# PRASEODYMIUM

Element Symbol: **Pr**

Atomic Number: **59**

An initiative of IYC 2011 brought to you by the RACI



International Year of  
**CHEMISTRY**  
**2011**



[www.raci.org.au](http://www.raci.org.au)

# PRASEODYMIUM

Element symbol: **Pr**

Atomic number: **59**

The name “praseodymium” comes from the Greek words ‘prasios’, meaning green, and ‘didymos’ meaning twin. This is because of the green colour of its salts and its close association with neodymium.

In 1841 a new substance was discovered by Carl Mosander which was thought to be a new element which was called “didymium” and was given the symbol Di in Medelev's first edition of the periodic table in 1869. However, didymium was found to be a mixture of things with samarium separated from didymium. It was in 1885 when Carl Welsbach was able to show that didymium was actually a mixture of two entirely new elements that he named praseodymium and neodymium. It took a further 46 years before pure metallic praseodymium was first produced.

Praseodymium and its salts play various roles in the arts. The salts are used to give glasses and enamel a yellow colour. Next time you go to the cinema, remember that it is the small amount of praseodymium in the carbon arc that gives the light a brilliant yellow cast to make daylight white light used motion-picture filming.

Praseodymium is used in protective goggles used by welders and glass blowers. Praseodymium and neodymium are mixed into the lenses to absorb yellow light so that all you see is the dull blue glow of the torch flame or a faint orange glow from hot glass.

When you mix praseodymium with magnesium, you get a high-strength alloy that is used in aircraft engines. Demand for praseodymium is also increasing because of its application in clean energy applications. For example, praseodymium can be used in neodymium-iron-boron magnets used in electric vehicle motors and wind turbine generators.

Rare earth elements, including praseodymium is used in light weight magnets in motors used in cars such as for car windows, windscreen wipers, starter motors and alternators, for example. It is also used in nickel metal hydride batteries.

Praseodymium occurs in minerals such as monazite and bastnasite. These minerals contain many rare earth metals. Annual production of praseodymium is approximately 2400 Tonne. The main mining areas are China, US, Brazil, India, Sri Lanka and Australia. The Mt Weld mine is the largest rare earth metal oxide mine in Australia. Geoscience Australia estimates Australia's monazite resources to be in the order of 6.1 Mt. Assuming the rare earth oxide content of monazite is about 60%, there could be up to 3.66 Mt rare earth oxides.

*Provided by the element sponsor Paul van der Beeke*

## ARTISTS DESCRIPTION

Praseodymium is used to manufacture Misch metal. This metal is used in lighter flints and tracer bullets. This inspired me to use woodcut as a medium, as it lends itself to create the sharp clean lines so prominent when looking at sparks of a lighter or the sharp lines of tracer bullets.

The green colour is inspired by the green oxide coating this metal develops when exposed to air, and the golden yellow is the characteristic colour provided by compounds of praseodymium.

The element symbol and atomic number are printed in a metallic pink, a prominent colour of tracer rounds in the night sky as well as the colour of the ammunition.

**BERT APERLOO**